CHAPTER 14 FACILITATING EXPORTS OF SUSTAINABLE TECHNOLOGY TO THE ASIA-PACIFIC REGION

14.1 Hawaii's Strategic Technology Marketing and Development Program

Hawaii's Strategic Technology Market Assessment and Development (STMAD) program is designed to facilitate increased exports of U.S. energy, environmental, and other sustainable technologies and related services into Asia-Pacific markets. STMAD focuses on Asia-Pacific markets due to their high growth history and their potential for future growth. A key objective of STMAD is to facilitate sustainable, technology-related economic development for Hawaii, create higher-value jobs, and diversify the State's economy. Hawaii and U.S. exports include sustainable technology (especially renewable energy); energy efficiency; advanced, high-efficiency fossil-fuel energy; recycling, reuse, and remanufacturing; information technologies; health care; ocean science and technologies; and environmental management, control, protection, and remediation. The energy-related elements of STMAD will help reduce fossil fuel use and will also help to mitigate and reduce greenhouse gas emissions, which contribute to global climate change.

14.1.1 STMAD Partnerships

Partnerships with industry, through business opportunities missions, government-to-government contacts throughout Asia, and the development of business leads through workshops and conferences in Hawaii are the central components of STMAD. STMAD seeks to match commercial applications of sustainable technologies and related services to targeted demand in the Asia-Pacific region.

U.S. federal government agencies and non-governmental organizations (NGOs) such as the National Association of State Energy Officials, Export Council for Energy Efficiency, National Association of Energy Service Companies, Council of State Governments, and others are active partners and participants in program activities. Such governmental facilitation of U.S. technology exports is a key component of the U.S. Department of Energy's (USDOE) Comprehensive National Energy Strategy.

Partnerships with academe, especially between the University of Hawaii (UH) and, for example, the Hawaii Natural Energy Institute (HNEI), are also core components of STMAD. These are aimed at matching commercial applications of sustainable technologies and related services to demand in the Asia-Pacific region.

These organizations and host Asia-Pacific countries are collaboratively conducting several energy and environmental resource and infrastructure market assessments to identify development opportunities. Energy from biomass, for example, has the potential to contribute significantly to the power mix in developing countries in Asia and the Pacific Rim due to their increasing demand for electricity and sizable biomass resources. U.S. energy efficiency technologies and services are other high-growth Asia-Pacific markets.

Because government policies and regulations are most often major drivers of demand for these sustainable energy and environmentally sustainable technologies and related services, policy transfer is an important export. Grant opportunities for such activities, funded by U.S. and Asia-Pacific governments, are growing, and U.S. and Hawaii consultants in these fields can compete for these dollars, which can contribute to our economy.

14.1.2 STMAD Goal, Priorities, and Activities

STMAD has the following major goals, priorities, and activities in these areas:

- **Supply.** Expand and diversify the export activities of Hawaii's existing sustainable technology and related service companies; and as a second priority, attract Mainland technology firms to locate in Hawaii;
- **Demand.** Identify and develop niche markets in strategic technology that Hawaii companies can serve now, or gain the capacity to serve, or that will attract Mainland technology enterprises to Hawaii;
- **Technology Industry Development and Promotional Activities.** Identify, develop and provide activities such as mentioned in 14.1.1, above, to support and partner with targeted industry and public sector audiences;
- **Specific Projects.** Identify, and facilitate development of specific projects to increase exports of U.S. technologies and services from Hawaii;
- **Finance.** Provide financial training, relating specifically to sustainable infrastructure projects, for potential client-country decision-makers; facilitate financing arrangements for specific projects; and
- Market Analyses and Evaluation. Measure, analyze, and report technology-related economic development in Hawaii, with the aim of increasing the efficiency and effectiveness of future STMAD Program activities.

14.1.3 Opportunities in Environmental Technology Exports: Hawaii's Competitive Edge

Unlike straightforward product exports, the business and technical transactions inherent to development of environmental infrastructure in the Asia-Pacific region require strong cross-cultural understanding. Many projects in the areas of environmental engineering and infrastructure development have faltered or failed because of language and cultural impasses – even at the basic technical level.

Hawaii has a strong Asian orientation, and its citizens possess inherent and valuable knowledge of the various Asian cultures. This knowledge could enhance the State of Hawaii's ability to fill the emerging need for individuals who can operate cross-culturally in supporting the delivery of hands-on environmental technologies.

14.2 STMAD's Current Activities

14.2.1 Center for Asia-Pacific Infrastructure Development

The State of Hawaii established the Center for Asia-Pacific Infrastructure Development (CAPID) as part of STMAD to promote exports of U.S. energy, environmental, transportation-related, and other infrastructure technologies and related services to facilitate sustainable economic development throughout the Asia-Pacific region, while helping to diversify and strengthen the American economy. In short, the CAPID will help open foreign markets to American goods and services.

Through its activities, the CAPID has begun assisting Hawaii companies to establish relationships crucial to entering markets in the Asia-Pacific. CAPID provides the structure for foreign-policy makers and infrastructure project planners, developers, and financiers – especially from the Asia-Pacific region – to learn about the latest non-traditional, innovative options for infrastructure project development. This was the purpose of the initial infrastructure project finance seminar, held in December 1997. Eighty-five high-level Chinese officials attended the seminar.

CAPID has sponsored two additional seminars in Hawaii – *Business Opportunities in the Asia-Pacific*, held October 23, 1998, and *1998 Year of the Tiger: Opportunities for Trade and Investment in China*, held January 23, 1998. The seminars helped American firms establish direct lines of communication for the development of infrastructure projects.

14.2.2 Hawaii-Philippines Energy Efficiency Technology and Policy Transfer Project

This Hawaii-Philippines Project on Energy Efficiency and Technology Transfer, conducted under STMAD, has four primary objectives:

- Introduce advanced Hawaii and U.S. energy efficiency technologies and policies to the Philippines;
- Introduce Hawaii and U.S. energy service companies to business development and partnering opportunities in that country;
- Provide policy advisory support on the refinement and enforcement of Philippine energy codes and standards; and
- Provide policy and technical assistance on designing and implementing utility demand-side management (DSM) programs and energy efficiency performance contracting.

The project has involved extensive collaboration among its participants, ensuring that only mutually beneficial and agreed upon activities are pursued. The Council of State Governments (CSG), through its State Environmental Initiative, provided U.S.-Asia Environmental Partnership (USAEP) with funding ($142,000), and have been active partners throughout the project.

The Project was completed on June 30, 1999, and a report, *Energy Efficiency Policy and Technology Transfer: A Hawaii-Philippines Case Study*, describing the project findings, results, and recommendations was published in October 1999.

To achieve the project objectives, three workshops were conducted:

- **February 1–2, 1999: Workshop in Honolulu on Policy and Technology Transfer Opportunities.** Nearly 60 persons attended the workshop in Honolulu, including the Executive Director of the USAEP and several senior officials of the CSG. Private-sector companies from Hawaii were showcased including HEI Power Corporation, Honeywell, and Johnson Controls, Inc. The eleven-person Philippine delegation was led by Undersecretary of Energy Ben-Hur Salcedo, who also met with Lt. Governor Mazie Hirono;
- **February 2–5, 1999: Utility Photovoltaic Group's International Renewable Energy Business Opportunities Workshop.** The Philippine delegation also attended the Workshop in Kona, Hawaii; and
- **May 31 and June 1, 1999: Workshop on Hawaii Energy Technologies and Services.** The workshop, held in Manila, examined Hawaii energy technologies and services available for export. Nearly 100 persons attended, including the Philippine Secretary and Undersecretary of Energy, and the Senior Commercial Officer of the United States Embassy.

The project has proven so successful that the USDOE has approved a grant for an additional $50,000 to expand the work that will continue to assist the Philippines in creating energy efficiency programs. DBEDT's Energy Research & Technology Division (ERTD) and the Philippines DOE have also received a "bridge funding" grant from the Council of State Governments in the amount of $40,000 to initiate the first-ever energy performance contract in the Philippines. ERTD will continue to seek additional support for the following planned actions:

- Improve capacity building through training of Philippines personnel;
- Conduct audits of Philippine facilities for performance-contracted retrofits and implement a performance contracting demonstration project;
- Helping the Philippines government to set an energy efficiency leadership example; and
- Consider and address the impacts of the electricity industry restructuring and deregulation on energy efficiency and renewable energy deployment in the Philippines.

14.2.3 Hawaii-Philippines Biomass-to-Electricity Assessment and Commercial Case Study Project

In partnership with Hawaii's ERTD and the Philippines Department of Energy, the UH-HNEI is conducting a biomass-to-electricity assessment and commercial case study project. The project will conduct a complete inventory of Philippine biomass feedstocks and project the future availability these feedstocks for use as fuel for electricity generation. The project is also developing recommendations for commercial application of the most economic and environmentally responsible energy-conversion technologies to develop these biomass fuels. The database and networking of individuals and companies that stem from this effort will ultimately help to identify opportunities and strategies for Hawaii companies to serve markets in the Philippines for commercial deployment of bio-energy technologies, products, and services.

UH-HNEI is also developing two case studies focusing on power generation at two sugar mills using bagasse – Victorias Milling Company and First Farmers Holding Corporation. If these mills implement the engineering retrofits of their mills to sufficiently increase the efficiency of their facilities, they may significantly increase their power generation and export.

The UH-HNEI and ERTD project team is following up with HEI Power Corporation's Philippine's representative, who has expressed interest in working with First Farmers as the contractor to retrofit this sugar mill according to the UH-HNEI report.

14.2.4 Technical and Market Assessments

14.2.4.1 Hainan Province, China, Energy and Environmental Infrastructure Assessment, March 1997

The State of Hawaii ERTD and HEI Power Corporation conducted this preliminary survey of the energy infrastructure and opportunities for exporting Hawaii technology and services in Hainan Province, People's Republic of China. The study identified business opportunities for Hawaii companies in the areas of coastal resource management, agriculture and ocean research and development, minerals development, and energy resource and technology development, including expansion of power generation facilities, and development of power transmission projects.

14.2.4.2 Assessment of Potential for Biomass Electricity in Philippines, Thailand, Malaysia, and Indonesia

The UH-HNEI and ERTD conducted a broad-based assessment of the potential for electricity production from a variety of bio-residues in these four ASEAN countries. The purpose of the assessment, which has been used by local biomass co-generation developers in their preliminary market analyses, was to provide information on near-term opportunities for supplying more electricity from biomass, a particularly competitive and abundant fuel in Asia.

14.2.4.3 Hawaii's Asia-Pacific Infrastructure Demand Profiles on the World Wide Web

To support infrastructure development, ERTD developed demand profiles for basic infrastructure for all Asia-Pacific countries. The profiles also list business and government contact information for each of the twenty countries profiled. These are available on the Internet at http://www.state.hi.us/dbedt/ert/cp/cp.html.

14.2.5 Business Opportunities and Technical Exchange Missions

14.2.5.1 Business Mission to Hong Kong, May 31–June 4, 1999

DBEDT and the Hong Kong Business Association sponsored this business mission. Meetings with government decision-makers and potential joint venture partners allowed American firms to learn firsthand about infrastructure development and business opportunities

14.2.5.2 Hawaii Trade Mission to Vietnam, May 18–30, 1999

The Vietnamese-American Chamber of Commerce and DBEDT organized this mission to Hanoi, Haiphong, Hue, and Ho Chi Minh City by seven representatives of U.S. firms. On May 21, 1999, the DBEDT Deputy Director signed an agreement with the Vietnam Ministry of Science Technology and Environment to pursue development of a cooperative environmental project. This agreement was the first of its kind between Vietnam and a U.S. State.

14.2.5.3 Trade and Sustainable Energy Technical Exchange Mission to Hainan Province, China, November 13–22, 1998

Sixteen Hawaii delegates went on this mission, which introduced Hawaii companies to business opportunities in Hainan. Over 70 key Chinese government officials and industry leaders participated in an introductory one-day seminar. The *Hainan-Hawaii Cooperation Committee* was formally established by execution of a proclamation by the Deputy Director-General, Hainan Province Department of Foreign affairs, and the DBEDT Deputy Director during a ceremony officiated by Hainan Governor Wang Xiaofeng.

ERTD led a concurrent technical mission to assess commercial renewable energy and energy-efficiency business opportunities for Hawaii companies in Hainan Province. This team included research engineers from the UH-HNEI and the UH Biosystems Engineering Department of the College of Tropical Agricultural and Human Resources. Three business deals involving Hawaii and Chinese partners were consummated during the mission.

14.2.5.4 Thailand Business Opportunities Mission, April 25 – May 4, 1997

Approximately twenty representatives from eighteen companies participated in this mission to Bangkok, Chiang Mai, and Phuket. Molokai Solar, a small, local solar

energy company, signed a memorandum of understanding for business development with a Thai company, while in Bangkok.

14.2.6 Other Facilitative Activities

14.2.6.1 State of Hawaii and Malaysian National Energy Strategy Delegation Mini-Workshop, August 27, 1999

The purpose of the workshop was to share and discuss the Malaysian National Energy Strategy Delegation's objectives for its technical visit to the United States and Europe. This delegation had been instructed personally by the Malaysian Prime Minister to develop a comprehensive national energy strategy, and it included a senior representative of the Prime Minister's Department's Planning Unit. Hawaii was the first stop on the delegation's itinerary.

As requested, ERTD, UH-HNEI, and HECO shared their experiences in development of a comprehensive Hawaii Energy Strategy, the State's international energy policy and technology outreach activities. This was done, in part, through focused discussions offering Hawaii's perspective on renewable energy (solar and biomass in particular); energy efficiency policies and incentives and their relationship to utility demand-side management programs; and energy industry restructuring. The Malaysian Delegation expressed enthusiastic interest in pursuing cooperative energy policy and technology transfer projects with Hawaii.

14.2.6.2 1998 Year of the Tiger: Opportunities for Trade and Investment in China, January 23, 1998

Taking advantage of the Chinese Trade and Investment Delegation visit, this one-day conference showcased closer ties between Hawaii and China. Trade and investment opportunities in China were presented by the Chinese delegation, and local firms shared their prospects for Hawaii firms in China's tourism market. Approximately 90 people attended this event.

14.2.6.3 Hong Kong Workshop: Infrastructure Projects Worth US$30 Billion Planned, February 5, 1999

This workshop showcased rail, road, housing, commercial, retail, and recreational infrastructure projects scheduled for development in Hong Kong from 1999 to 2004. Approximately 100 people attended this forum sponsored by the Hong Kong Business Association of Hawaii, the Hong Kong Economic and Trade Office in San Francisco, and DBEDT.

14.2.6.4 Business Opportunities in the Asia-Pacific, October 23, 1998

Especially geared towards engineers and architects, this event featured a panel to discuss business opportunities in the Asia-Pacific. Approximately 130 people attended this forum.

14.2.6.5 Regional Energy Emergency Seminar and Exercise, May 6–8, 1998

This exercise and seminar was a component of the State of Hawaii's annual Civil Defense hurricane exercise, *Makani Pahili 98*. To simulate response capability during an energy emergency, regional dialogue between the USDOE, the Federal Emergency Management Agency, other federal agencies, the National Association of State Energy Officials, State and County governments, and private industry was demonstrated on-line through a direct Ethernet connection to the Pacific Disaster Center (located on Maui). The exercise simulated management information and decision-making processes supporting the multiple "Emergency Support Functions" that have been identified in federal and State disaster emergency plans. This exercise increased State and industry preparedness for an energy emergency. High-level Indian military officials, sponsored by the U.S. Department of Defense, also participated in this unique event.

14.2.6.6 December 8–12, 1997, Infrastructure Project Finance Seminar

In 1995, the Director of DBEDT led a small delegation to the People's Republic of China. As a result of this visit, Hawaii firms were able to establish direct business contacts with their Chinese counterparts and to began serious, detailed discussions with them. Due to the interest shown by the Chinese government officials and others in attendance at the State-sponsored investment seminar during this visit, DBEDT organized a seminar in December of 1997 to disseminate information on innovative financing of infrastructure projects. The theme for this seminar was "Hawaii: China's Gateway to America." Approximately eighty-five high-level Chinese infrastructure project planning and development officials, financial and banking officials, judges, and attorneys participated in the meeting.

14.2.6.7 Hawaii Energy, Environmental and Engineering Technology Export Directory

This 60-page directory, in English, Chinese, and Japanese, lists hundreds of Hawaii companies within the sectors named, and is used to promote Hawaii firms throughout the Asia-Pacific. It is in its second printing.

14.3 Specific Recommendations

The following are specific recommendations for the State's activities:

14.3.1 RECOMMENDATION: Continue to Take Advantage of Federal and NGO Support for State Energy and Environmental Technology Export Initiatives

Suggested Lead Organizations: DBEDT, Federal Agencies, and NGOs

Continue to obtain financial and technical support from federal agencies that offer technical and financial assistance to State programs designed to assist businesses increase exports of energy and environmental technologies from the Untied States

to Asia. Potential sources include USDOE, USDOC, USAID, and several NGOs, such as the National Association of State Energy Officials, Export Council for Energy Efficiency, National Association of Energy Service Companies, Council of State Governments.

14.3.2 RECOMMENDATION: Continue to Conduct Market Analyses and Evaluations Relevant to the Needs of Hawaii Firms Interested in Technology-based Economic Development

Suggested Lead Organizations: DBEDT

Continue to gather relevant financial information, employment and salary data, current and desired export activities, and other information on Hawaii technology companies, and *most important*, industry recommendations on how state government programs can facilitate their enterprises. This information should be used to make future STMAD Program activities more efficient and effective. The inventory of Hawaii technology companies should be kept up to date. This database includes companies engaged in the areas of energy, ocean, environmental, and other sustainable technologies.

14.3.3 RECOMMENDATION: Continue to Publish The Hawaii Energy, Environmental, and Engineering Export Service Directory

Suggested Lead Organization: DBEDT

To further boost exports of Hawaii's advanced, sustainable technologies and services, DBEDT has published the *Hawaii Energy, Environmental, and Engineering Export Service Directory*. It is in its second printing. The directory promotes and markets Hawaii's technology and service providers to an Asia-Pacific and international readership. The directory lists firms such as traditional energy developers; biomass-to-energy and other alternative energy and energy efficiency technology providers and consultants; all categories of engineering, planning, and environmental technology and service providers. The directory is in English, Chinese, and Japanese, and is accessible on the Internet http://www.state.hi.us/dbedt/ert/heeetsed.html. The cost of this publication was shared with Hawaii companies to leverage funds to the fullest extent possible.

14.3.4 RECOMMENDATION: Continue to Conduct Business and Technical Exchange Missions and Reverse Trade and Technical Missions

Suggested Lead Organizations: DBEDT and Partner Organizations

Business and technical exchange missions and reverse trade and technical missions identify and facilitate development by Hawaii and other U.S. companies of specific

technology and related service export opportunities; e.g., energy and environmental infrastructure development projects.

Technical exchange missions will focus on the assessment and matching of Hawaii-based technology, service expertise, and training resources with specific Asia-Pacific markets. Energy and environmental infrastructure assessments should be conducted in partnership with UH, industry, and host countries to identify specific project development opportunities for Hawaii companies and other U.S. businesses.

Reverse missions to Hawaii should be conducted to provide potential customers from abroad with a better understanding of Hawaii-based technology, service expertise, and training capabilities. This should be accomplished through participation by these potential customers in workshops with industry and through visits to commercial project sites in Hawaii.

14.3.5 RECOMMENDATION: Formalize the STMAD Process

Suggested Lead Organization: The Hawaii State Legislature

Establish a State-funded STMAD program in order to ensure its continued success through the development of long-term relationships with the private sector, NGOs, and other public organizations that offer significant leveraging of State funds. Without a long-term commitment of State funds, these relationships and the ability to provide match funds to maintain Hawaii's competitiveness for lucrative grants and partnerships cannot be sustained.

14.3.6 RECOMMENDATION: Actively Advise and Promote Hawaii Energy and Environmental Companies

Suggested Lead Organizations: DBEDT and Partner Organizations

The State of Hawaii, with the active involvement of, and support from, the companies themselves, and organizations such as the U.S. Department of Commerce, USDOE, Hawaii's Chambers of Commerce, and other relevant NGOs and organizations, should conduct a series of workshops to clarify the facilitative roles and to explain how to make the most effective use of government agencies and NGOs in promoting sustainable-technology-based economic development.

The workshop series should culminate with an international conference and exhibition, with local, national, and international experts addressing topics of high interest to the private sector. It should serve as a "sustainable technology fair" wherein local and Mainland sustainable technology companies, sustainable technology industry organizations, and companies offering support services may exhibit technologies and services, and prospect for business development opportunities in Hawaii and Asia-Pacific markets. Government and private sector officials from potential Asia-Pacific customer nations should be invited to participate.

14.3.7 RECOMMENDATION: Strongly Support and Sustain the Millennium Workforce Development Initiative

Suggested Lead Organization: DBEDT

Continue DBEDT's facilitation of the public- private-sector Environmental Science and Technology working group chartered under the Governor's Millennium Workforce Development Initiative. A short-term objective of the Initiative is to enable development of a skilled workforce that is relevant and responsive to immediate industry needs. Recognizing the importance of Asia-Pacific environmental markets, the Environmental Science and Technology Working Group also identified strategies for longer-term industry development. Its recommendations to the Governor will include near-term implementation of training programs in environmental technology and longer-term industry support for outreach to Asia-Pacific markets.

14.3.8 RECOMMENDATION: Establish a Center for Asia-Pacific Infrastructure Development in Hawaii

Suggested Lead Organizations: DBEDT and Partner Organizations

DBEDT is in the process of establishing a Center for Asia-Pacific Infrastructure Development. The Center will be a partnership with the U.S. Department of Commerce, private companies, and other organizations such as the East-West Center and the American Consulting Engineers Council.

The Center would assist American small- and medium-sized enterprises to establish relationships crucial to entering markets in the Asia-Pacific. This would be achieved by providing the structure for foreign policy makers and infrastructure project planners, and developers and financiers – especially from the Asia-Pacific region –to learn about the latest non-traditional, innovative options for development of infrastructure projects. Foreign officials would learn about the criteria used by international contractors and financial institutions to evaluate and prioritize projects. Most importantly, foreign participants (mostly from the Asia-Pacific region) would be provided the opportunity to network with representatives of American firms to establish direct lines of communication for the actual development of infrastructure projects. In this way, the Center would be able to provide American companies a competitive advantage in securing infrastructure development contracts. At the same time it would serve the needs of the foreign countries during the planning, finance, and development phases of infrastructure projects.

The Center will also be a place for learning. In particular, participants could bring actual projects to the Center and learn by working with others to design project prospectuses that meet the standards of international servers and funders of infrastructure development. The Center's programs will help attendees shape priorities, determine feasibility, prepare for funding, and develop bases for working

with the entities (especially U.S. companies) required to help bring the infrastructure projects to fruition.

14.3.9 RECOMMENDATION: Continue to Promote Sustainability Programs in Cooperation with the East-West Center's Asia-Pacific Economic Cooperation Program (APEC)

Suggested Lead Organizations: East-West Center and DBEDT

DBEDT works closely with the East-West Center and other organizations to initiate partnerships that provide technical expertise in energy and environmental protection from Hawaii to the Pacific Islands and Pacific Rim nations. These partnerships will not only strengthen the region, but will increase opportunities for Hawaii business abroad. This was the case with the November 9, 1999, meeting of the APEC Expert Subgroup on Inter-Utility Demand-Side Management, coordinated by DBEDT. The event was co-sponsored by Electric Power Research Institute and the East-West Center.